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(54) **Method and apparatus for preparing lasagne**

(57) A method for preparing lasagne, particularly lasagne alla Bolognese. The method includes the steps of preparing a filling (F), preparing a sheet of pasta (P) and depositing the filling (F) onto the pasta sheet (P) to obtain at least one layer of semi-processed lasagne (L). In a

dosing step, the filling (F) is deposited onto the pasta sheet (P) at a substantially low temperature, so that its organoleptic properties can be preserved substantially unchanged. An apparatus for preparing lasagne, particularly lasagne alla Bolognese, and the lasagne obtained using this apparatus.

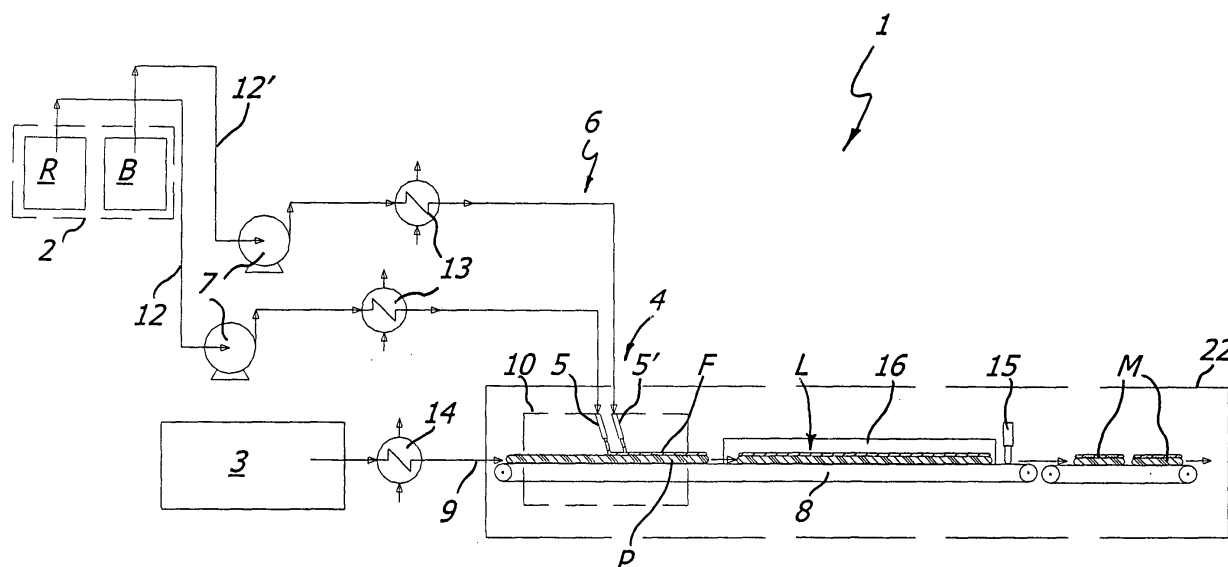


FIG. 1

Description

Field of invention

[0001] The present invention finds application in the food industry and particularly relates to a method and an apparatus for preparing lasagne, particularly lasagne alla Bolognese.

Background of the invention

[0002] The term "lasagne" is intended to indicate a cookery product composed of pasta layers and filling layers. The best known lasagne are the "lasagne alla Bolognese", which are composed of egg pasta, Bolognese sauce (a meat-based tomato sauce) and béchamel sauce.

[0003] Lasagne exist in various forms, all invariably composed of pasta layers and tomato sauce and béchamel layers alternated as desired. The final layer is sprinkled with grated mature cheese.

[0004] Current industrial production is essentially based on a method including the steps of preparing the filling, forming the pasta into a sheet and dosing the filling onto the pasta sheet to obtain at least one layer of semi-processed lasagne, to be later packaged and refrigerated for distribution and sale.

[0005] After preparation, the pasta is cut into portions and manually or semiautomatically placed in the final packaging tray. Each layer of pasta is topped with a dose of hot filling, such as tomato sauce, béchamel or a mixture of tomato sauce and béchamel.

[0006] This step is repeated a certain number of times until the desired product (with 3, 4 or 5 layers) is obtained.

[0007] Typically, tomato sauce and béchamel dosing occurs at very high temperatures (at least above 70°C, preferably above 80°C), to provide even distribution thereof over the pasta and facilitate some sort of self-pasteurization of the product. For the above step to be carried out in safely hygienic conditions, dosing may occur in a clean room under nitrogen overpressure or sterile (filtered) air conditions, if the presence of personnel is provided.

[0008] Hot dosing causes lasagne to be maintained at high temperatures for long times, leading to qualitative degradation of pasta, that becomes overcooked, and of the filling, because the tomato sauce and the béchamel continuously mix throughout the dosing step, thereby losing most of their original organoleptic properties.

[0009] The hot tomato sauce and béchamel dosing system does not allow operation in a clean environment due to the presence of vapors, condensation, and hot sprays. Also, the presence of personnel to ensure that the tray is properly conveyed through the various dosing stations, significantly reduces air quality in the clean room, if present.

Summary of the invention

[0010] The object of the present invention is to overcome the above drawbacks, by providing a method and an apparatus that is highly efficient and relatively cost-effective.

[0011] A particular object is to provide a method and an apparatus for preparing lasagne, providing a final product of high organoleptic quality, comparable to homemade lasagne.

[0012] A further object is to provide a method and an apparatus for preparing lasagne, that ensures maximized asepsis and hygiene of the various steps of the process.

[0013] These and other objects, as more clearly explained hereafter, are fulfilled by a method as claimed in claim 1, which comprises the steps of providing a filling, providing a pasta sheet, depositing the filling onto the pasta sheet to obtain at least one layer of semi-processed lasagne, characterized in that in said dosing step the filling is deposited onto the pasta sheet in a substantially cold state, so that the organoleptic properties of the latter are preserved substantially unchanged.

[0014] In another aspect, the invention relates to an apparatus as defined in claim 11, which comprises means for providing a filling, means for providing a pasta sheet, means for depositing the filling onto the pasta sheet to obtain at least one layer of semi-processed lasagne, a first line for fluid connection of the means for providing the filling with the deposition means, a second line for connection of the means for providing the pasta sheet with the deposition means, characterized in that the deposition means deposit the filling onto the pasta sheet in a substantially cold state, so that the organoleptic properties of the latter are preserved unchanged.

[0015] In yet another aspect, the invention relates to packaged lasagne as defined in claim 21, comprising two or more distinct and separate portions, optionally one on top of the other, each being only composed of a lower layer defined by a pasta sheet and an upper layer essentially consisting of a tomato sauce strip and/or a béchamel strip.

[0016] Advantageously, the tomato sauce may be Bolognese sauce.

[0017] Advantageous embodiments of the invention are defined in accordance with the dependent claims.

Brief description of the drawings

[0018] Further features and advantages of the invention will be more apparent from the detailed description of a preferred, non-exclusive embodiment of a method and an apparatus according to the invention, which is described as a non-limiting example with the help of the annexed drawings, in which:

FIG. 1 is a schematic view of an apparatus according to the invention;

FIG. 2 is a top view of the dosing station of the apparatus of Figure 1;

FIG. 1 is a schematic view of lasagne obtained with the method and/or apparatus of the invention.

Detailed description of a preferred embodiment

[0019] Referring now to the above figures, the method and apparatus of the invention may be advantageously employed for the preparation of lasagne, particularly lasagne alla Bolognese.

[0020] The apparatus, generally designated by numeral 1, essentially comprises means 2 for providing the filling F, means 3 for providing a pasta sheet P and means 4 for dosing the filling F onto the pasta sheet P.

[0021] As used herein, the term "provision" and derivatives thereof, designates the preparation of a relevant component for a relevant process step, including any preventive treatment designed for optimal performance of such relevant step, from simple collection and possible storage of pre-packaged material, preparation from base ingredients, thermal or cooking treatments, thermal and/or chemical and/or physical pre-treatments and the like.

[0022] In a preferred embodiment, means 2 for providing the filling F may include a cooking equipment located in a dedicated area, in which the filling F, for instance composed of tomato sauce R and béchamel B, is cooked in a per se known manner.

[0023] The tomato sauce R, that may be bolognese sauce, and the béchamel B may be cooked separately from each other. It shall be further understood that the filling F may also consist of a mixture comprising both béchamel B and tomato sauce R.

[0024] Means 3 for providing the pasta P may include another cooking equipment, possibly located in a dedicated area other than that of the cooking equipment for the filling F, in which flour products, such as soft-wheat flour and/or semolina are mixed with eggs and possibly water. After mixing, the pasta so prepared is sheeted or extruded into a sheet and then cooked and/or pasteurized.

[0025] The dosing means 4 may include one or more dosing units 5, 5', 5'', 5''' in fluid connection with the means for providing the filling F via a first line 6.

[0026] The latter may be composed, for instance, of first and second conduits 12, 12' in which the tomato sauce R and the béchamel B respectively, that constitute the filling F, are pumped by means of pumps 7. This will allow the dosing units 5, 5'' and 5', 5''' to be independently fed with the tomato sauce R and the béchamel B respectively.

[0027] As shown in Figure 2, the dosing units 5, 5', 5'', 5''' may be arranged above a belt conveyor 8, which may be part of a second line 9 for connection of the means 3 for providing the pasta P with the area 10 including the dosing means 4.

[0028] Thus, the filling F may be deposited on the pasta

sheet P from above, to obtain a layer of semi-processed lasagne L.

[0029] The filling (F) that comes out of the dosing units 5, 5', 5'', 5''' is deposited onto the pasta sheet P in a substantially cold or cooled state, so that its organoleptic properties can be preserved substantially unchanged.

[0030] The temperature at which the filling F is deposited on the pasta sheet P, which is preferably the temperature that the filling F can have when it contacts the surface of the pasta P, may be low enough to allow even deposition thereof on the pasta P, as a "semisolid" strip of the desired thickness. Those skilled in the art may adjust such temperature as desired, to a value lower than or equal to the operating environment.

[0031] The dosing temperature may be low enough to avoid any change to the special organoleptic properties of the filling F, while allowing the latter to maintain optimal rheological properties, and particularly such a viscosity as to allow it to be pumped along the line 6 without damaging it.

[0032] Advantageously, the filling F may be deposited onto the pasta sheet P at a temperature below 25°C, preferably below 20°C and more preferably from 5°C to 15°C.

[0033] Thanks to these low temperatures direct cold dosing of the filling F may take place onto the pasta P when it lies on the belt conveyors outside the final packaging container, for enhanced hygiene safety.

[0034] Such configuration of the apparatus further allows the filling F to be deposited with different thicknesses based on production requirements, such as from 7 to 11 mm. For example, the strip 23 of tomato sauce R may be designed to have a thickness differing from that of the strip 23' of béchamel B, depending on the desired product and in response to organoleptic and cost balancing optimization.

[0035] Also, with this configuration, the béchamel B and the tomato sauce R may be deposited onto the pasta sheet P in adjacent layers, and will not mix on the pasta P due to their low temperatures.

[0036] Therefore, the output of the area 10 with the dosing means 4 will be semi-processed lasagne L composed of a lower layer of pasta P and an upper layer of filling F, composed of adjacent strips of tomato sauce R and béchamel B, designated by numerals 23, 23' respectively in Figure 2.

[0037] The filling F may be withdrawn in a cold state from a storage site, or may be cooled after its preparation on the cooker 2, preferably before dosing.

[0038] Conveniently, the apparatus 1 may include first means 13 for cooling the filling, situated downstream of the means 2 for preparing it, and preferably upstream of the dosing means 4 along the first fluid connection line 6. The first cooling means 13 may include heat exchangers, for example of the tube-in-tube or scraped-surface type.

[0039] The cooling step may either occur prior than the dosing step or occur and/or continue during such step.

This means that the filling F may be cooled before reaching the dosing units 5, 5', 5", 5''' and/or be cooled during dosing.

[0040] Suitably, the first cooling means 13 are situated directly downstream of the means 2 for providing the filling F, so that the step for cooling the latter comes immediately after its cooking, with no steps intervening therebetween. Thus, the bacterial count in the filling F remains at very low levels, thanks to the immediately preceding cooking.

[0041] In a preferred, non exclusive embodiment, second cooling means 14 may be provided for cooling the pasta sheet P to a temperature below 30°C and preferably below 20°C. The second cooling means 14, that may consist of cold water and/or air jets, may be arranged along the second connection line 9 upstream from the area 10 with the dosing means 4, as shown in Figure 1.

[0042] By this additional cooling step, the pasta P will not be subjected to excessive thermal stresses deriving from contact with the cold filling F during the following dosing step.

[0043] Conveniently, the apparatus 1 may include cutting means for cutting the layer of semi-processed lasagne L, generally indicated by numeral 15, to obtain a plurality of portions M of predetermined shape and size. The cutting means 15 may consist, for example, of a station equipped with metal blades, ultrasounds, laser or a water-jet cutting arrangement.

[0044] In a preferred, non exclusive embodiment, the cutting means 15 may be designed to cut the semi-processed lasagne L at the output from the area 10 at the points of separation 24 of the strips 23, 23' of the tomato sauce R and béchamel B.

[0045] In other words, the longitudinal cuts may be substantially as wide as the strips of béchamel B and tomato sauce R. The cutting means 15 may include, for instance, sharp-edged tools 18 whose mutual distance d corresponds to the width l of the strips 23', 23 of béchamel B and tomato sauce R, which may be in turn controlled, for instance, by the size of the output opening of the dosing units 5, 5" and 5', 5'''.

[0046] The length of the portions M of lasagne may be controlled by another sharp-edged tool sliding along the semi-processed product L perpendicular to the direction of feed thereof.

[0047] The apparatus may further include third cooling means 16 interposed between the dosing means 4 and the cutting means 15 for cooling said at least one layer of semi-processed lasagne to a temperature below 4°C, and preferably below 0°C to improve the cutting phase.

[0048] The third cooling means 16 may consist, for example, of a liquid nitrogen- or air-cooled tunnel for the passage of the semi-processed lasagne L coming out of the area 10 in which the filling F is dosed onto the pasta P.

[0049] Thanks to this additional cooling step for cooling to negative temperatures, the portions M that come out of the area with the cutting means 15 will actually have the form of lasagna "bricks", each formed of a lower layer

of pasta P and an upper layer of filling F, which may be in turn composed of béchamel B only, tomato sauce R only or a mixture of the two. The upper layer may be coextensive with the lower level. The thickness of the filling F may be of 7 to 11 mm, according to specific requirements.

[0050] Each portion or "brick" M can be clearly distinguished from the others, has a well-defined geometry and no layer of edible or non-edible material surrounding it.

[0051] After the cutting step, the portions M are carried to the packaging station. Here, the various portions M may be placed in a tray V capable of containing one or more portions. In the latter case, as is known in the art, gravity deposition may be provided, to obtain trays V containing, for example, three, four or five portions M in overlapped or side-by-side positions, as shown in figure 3.

[0052] In any case, regardless of the number of portions in each tray, the various portions M will be distinguishable from each other, because the top surface of the filling F of one portion will not be permanently attached to the bottom surface of the pasta layer P of the overlying portion.

[0053] The step of filling the tray, whose size may be comparable to that of the portion M, may be followed by a step in which grated cheese is dosed onto the surface of the product. For this purpose, as is known in the art, the trays are fed below a grated cheese sprinkling station, with cheese being deposited by gravity onto the surface of the portion.

[0054] The grated cheese will be always deposited onto a cold surface, as a further guarantee of quality of the raw materials being used. Grilling of cheese to form crusts will only occur upon final preparation of lasagne at home.

[0055] The tray will be thus fed to the packaging station, where it will be sealed. Here, the product will be packaged at a temperature well below 4°C, due to the preceding treatments. Cold packaging of the product is the best solution to maintain the initial microbial count unchanged.

[0056] Now, the trays directed to the market of "fresh products" will be placed in a refrigerator at 0/4°C, whereas those directed to the market of "frozen products" will be frozen to -18°C. Freezing of the portions M may also occur upstream from the packaging step.

[0057] Advantageously, the dosing area 10 and/or the cutting area and/or the packaging area may include means for creating a protective atmosphere or filtered air, possibly by introducing nitrogen and/or sterile filtered air therein.

[0058] In a preferred non exclusive embodiment, the entire section 22 downstream from the provision means 2, 3 may be equipped with means for protective atmosphere generation, so that all the steps next to the preparation of the filling F and the pasta P can be carried out under protective atmosphere or filtered air, preferably including packaging.

[0059] The foregoing disclosure clearly shows that the method and apparatus of the invention fulfill the intended objects, and particularly the object of preparing lasagne with the final product having a high organoleptic quality, comparable to homemade lasagne.

[0060] Furthermore, since all production steps are carried out at low temperature or under protective atmosphere, asepsis and hygiene are effectively ensured throughout the process.

[0061] Easy handling of the various portions M, distinct and separate from each other, will ensure high automation of the whole process, and minimize human personnel requirements.

[0062] The invention is susceptible of a number of changes and variants, within the inventive concept disclosed in the appended claims. All the details may be replaced by other technically equivalent elements, and the materials may be different depending on different needs.

[0063] While the invention has been described with particular reference to the accompanying figures, the numerals referred to in the disclosure and claims are only used for the sake of a better intelligibility of the invention and shall not be intended to limit the claimed scope in any manner.

Claims

1. A method for preparing lasagne, particularly lasagne alla Bolognese, comprising the steps of:

- providing a sheet (P) of pasta;
- providing a filling (F);
- depositing the filling (F) onto the sheet (P) to obtain at least one layer of semi-processed lasagne (L);

characterized in that the filling (F) is deposited onto the pasta sheet (P) substantially in a cold state, so that the organoleptic properties of the sheet (P) can be preserved substantially unchanged.

2. Method as claimed in claim 1, wherein the temperature (T) of deposition of the filling (F) is lower than 25°C, preferably lower than 20°C and more preferably from 5°C to 15°C.
3. Method as claimed in one or more of the preceding claims, wherein the step of providing the filling (F) includes cooking thereof, said step of cooling the filling (F) coming immediately after said cooking step.
4. Method as claimed in one or more of the preceding claims, wherein said step of providing the pasta sheet (P) includes a step in which the latter is cooled, before said dosing step, to a temperature below 30°C, and preferably below 20°C.

5. Method as claimed in one or more of the preceding claims, comprising a step in which said at least one layer of semi-processed lasagne (L) is cut into a plurality of portions (M) of predetermined shape and size, said method further comprising a step in which said at least one layer of semi-processed lasagne (L) is cooled, before said cutting step, to a temperature below 4°C, preferably below 0°C.

6. Method as claimed in one or more of the preceding claims, wherein said filling (F) is composed of tomato sauce (R) and béchamel (B) wherein, during said dosing step, said tomato sauce (R) and said béchamel (B) are deposited onto said pasta sheet (P) independently of each other to form semi-processed lasagne (L) only composed of a lower layer defined by said pasta sheet (P) and an upper layer composed of adjacent strips (23, 23') of tomato sauce (R) and béchamel (B).

7. Apparatus for preparing lasagne, particularly lasagne alla Bolognese according to the method as claimed in one or more of the preceding claims, comprising:

- means (2) for providing a filling (F);
- means (3) for providing a pasta sheet (P);
- means (4) for depositing the filling (F) onto the pasta sheet (P) to obtain at least one layer of semi-processed lasagne (L);
- a first line (6) for fluid connection of said means (2) for providing the filling (F) with said deposition means (4);
- a second line (9) for connection of said means (3) for providing the pasta sheet (P) with said deposition means (4);

characterized in that said deposition means (4) deposit the filling (F) onto the pasta sheet (P) substantially in a cold state, so that its organoleptic properties can be preserved substantially unchanged.

8. Apparatus as claimed in claim 7, wherein the filling (F) is deposited onto the pasta sheet (P) at a temperature below 25°C, preferably below 20°C and more preferably from 5°C to 15°C.
9. Apparatus as claimed in one or more of the preceding claims, comprising second cooling means (14) for cooling said pasta sheet (P) to a temperature below 30°C, and preferably below 20°C, said second cooling means (14) being arranged along said second line (9) upstream from said dosing means (4).
10. Apparatus as claimed in one or more of the preceding claims, comprising cutting means (15) for cutting said at least one layer of semi-processed lasagne (L) into a plurality of portions (M) of predetermined

shape and size, said apparatus further comprising third cooling means (16) interposed between said deposition means (4) and said cutting means (15) for cooling said at least one layer of semi-processed lasagne (L) to a temperature below 4°C, preferably below 0°.

11. Apparatus as claimed in claim 10, wherein said filling (F) is composed of tomato sauce (R) and béchamel (B), said first fluid connection line comprising first and second conduits (12, 12') for independently feeding tomato sauce (R) and béchamel (B) respectively to said deposition means (4).
12. Apparatus as claimed in claim 11, wherein said deposition means (4) include a plurality of dosing units (5, 5', 5'', 5''') in side-by-side fluid relation, and alternately connected with said first and second conduits (12, 12') for depositing adjacent strips (23, 23') of either tomato sauce (R) or béchamel (B), each having a predetermined width (1), onto said pasta sheet (P),
13. Apparatus as claimed in claim 12, wherein said cutting means (15) include sharp-edged tools (18) whose mutual distance (d) substantially corresponds to said width (l) of each of said strips (23', 23), for cutting said at least one layer of semi-processed lasagna (L) at the separation points (24) therebetween.
14. Pre-packaged lasagne, particularly obtainable with the method as claimed in one or more of claims 1 to 10, comprising two or more distinct and separate portions, optionally one on top of the other, each of said portions being only composed of a lower layer defined by a pasta sheet (P) and an upper layer essentially formed of a strip (23) of tomato sauce (R) and/or a strip (23') of béchamel (B).
15. Lasagne as claimed in claim 14, wherein said upper layer (23, 23') is substantially coextensive with said lower layer (P).

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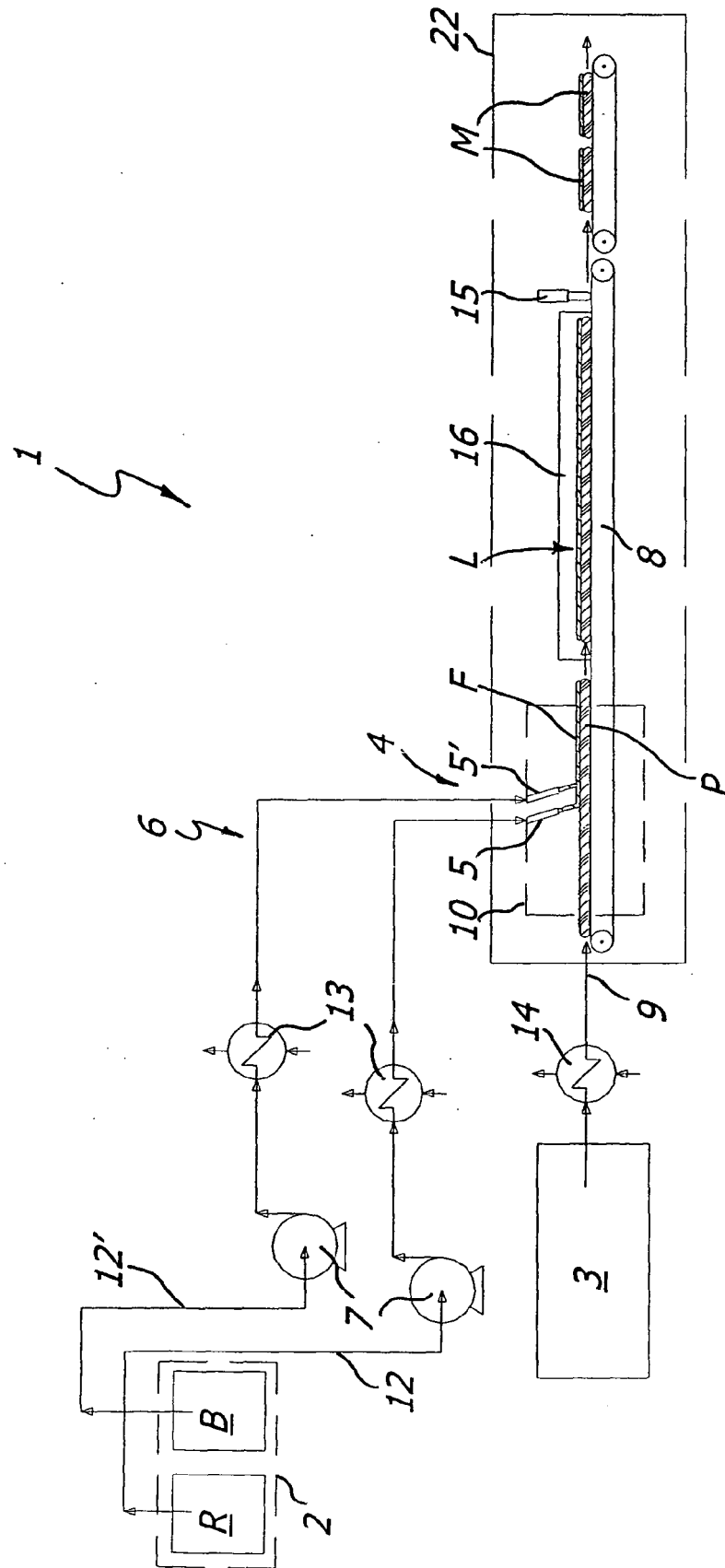


FIG. 1

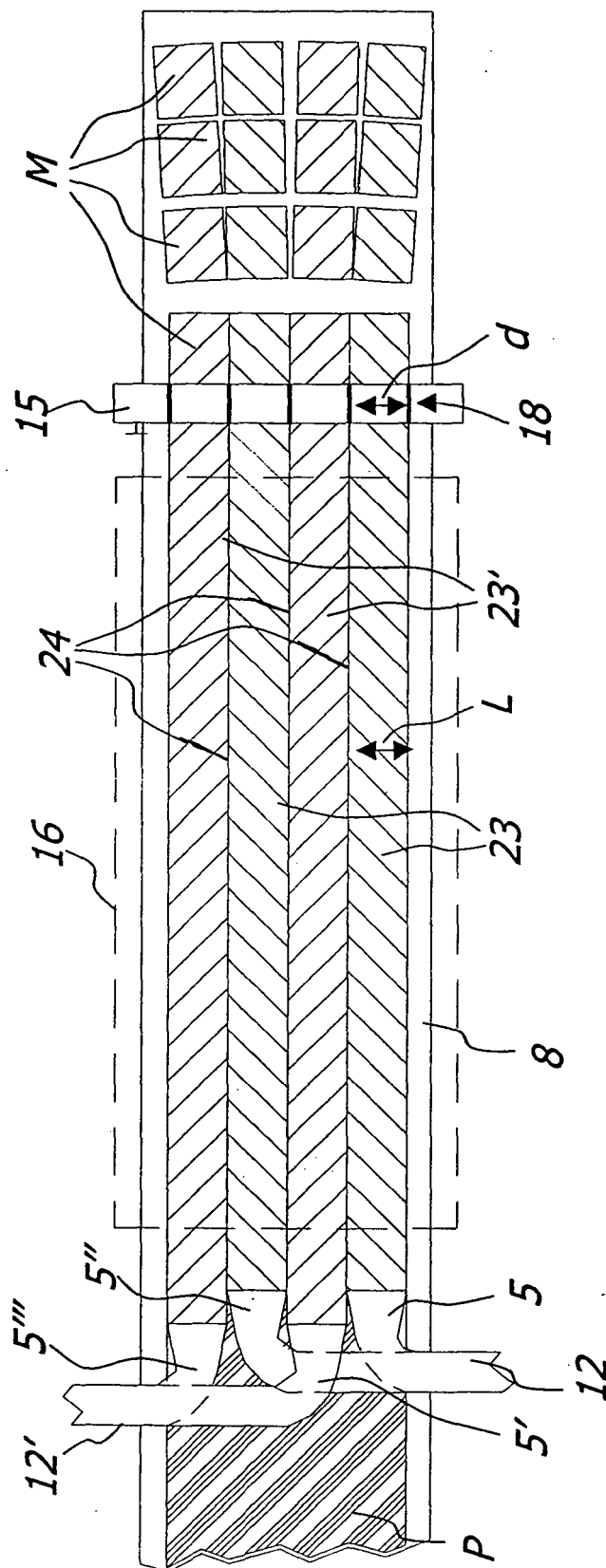


FIG. 2

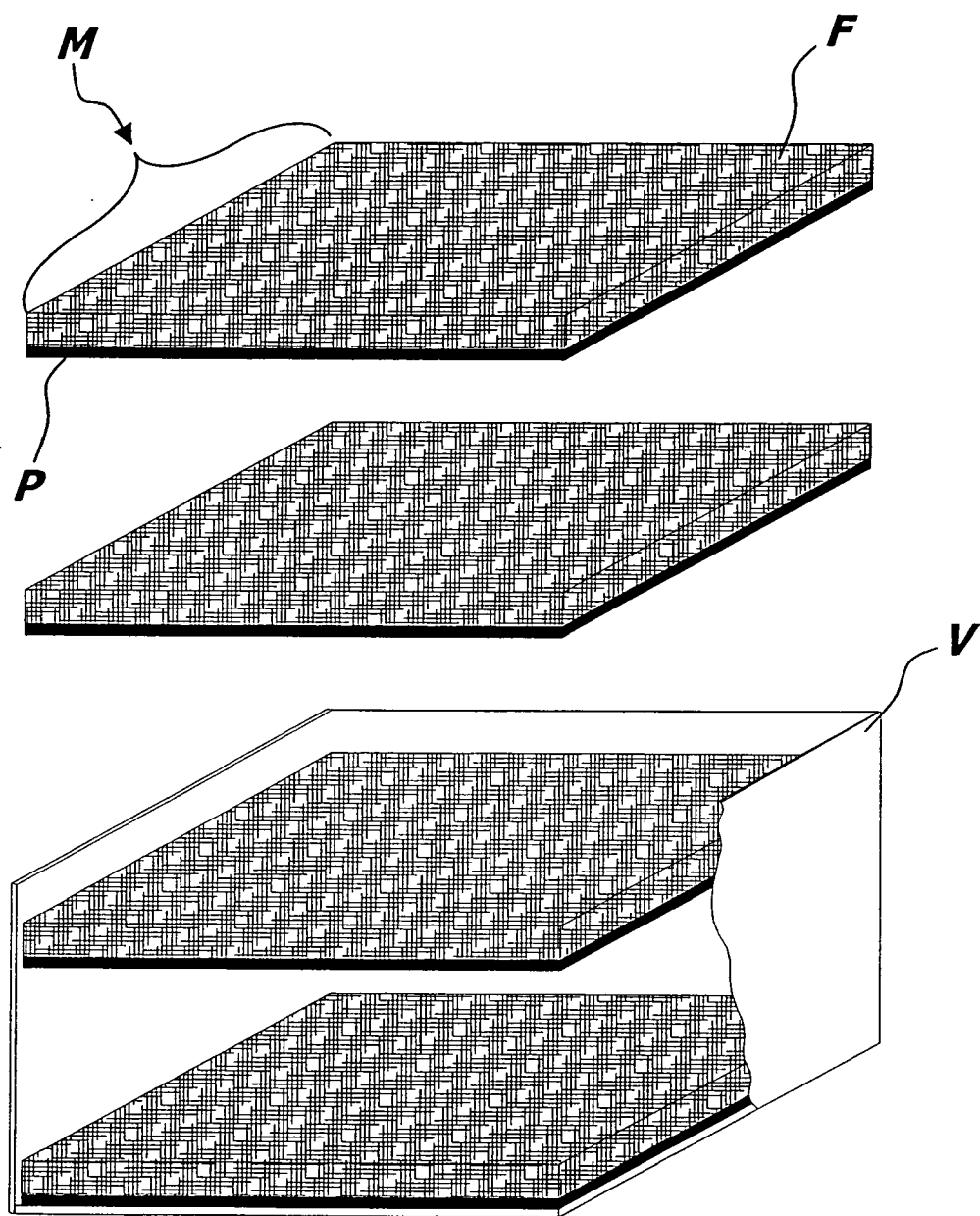


FIG. 3



EUROPEAN SEARCH REPORT

Application Number
EP 08 01 0417

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 5 939 113 A (HURSH JEFFREY A [US]) 17 August 1999 (1999-08-17) * claims * * examples * * figures * * column 4, line 36 - column 5, line 59 * * column 6, lines 13-15 * -----	1,2,7,8, 14,15	INV. A23L1/16 A23L1/00
X	EP 0 323 538 A (FRISCO FINDUS AG [CH]) 12 July 1989 (1989-07-12) * claims * * figures * * column 1, line 31 - column 7, line 54 * -----	1,2,4, 7-9,14, 15	
X	US 4 418 085 A (BECQUELET LOUIS E [FR]) 29 November 1983 (1983-11-29) * claims * * figures * * column 1, line 60 - column 5, line 37 * -----	1,2,4, 7-9,14, 15	
X	US 5 780 091 A (CASSETTA JAMES VINCENT [US] ET AL) 14 July 1998 (1998-07-14) * claims * * figures * * examples * * column 3, line 14 - column 5, line 29 * -----	1,2,7,8, 14,15	A23L
X	CA 1 299 434 C (FUDA LEO [CA]) 28 April 1992 (1992-04-28) * claims *	1,2,7,8, 14,15	
X	EP 0 882 406 A (NESTLE SA [CH]) 9 December 1998 (1998-12-09) * claims * * examples * * column 1, line 7 - column 15, line 16 * ----- -/--	14	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 July 2009	Examiner Bondar, Daniela
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EUROPEAN SEARCH REPORT

Application Number
EP 08 01 0417

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 798 343 A (VITALE C) 19 March 1974 (1974-03-19) * the whole document *	1-15	
A	US 4 711 165 A (CODINO LENO [US]) 8 December 1987 (1987-12-08) * the whole document *	1-15	
A	US 6 558 720 B1 (KARNER JAMES EDWARD [US]) 6 May 2003 (2003-05-06) * the whole document *	1-15	
A	US 2005/181100 A1 (PANAIOLI SANDRO [IT] ET AL) 18 August 2005 (2005-08-18) * the whole document *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 July 2009	Examiner Bondar, Daniela
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 01 0417

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01-07-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5939113	A	17-08-1999	NONE	
EP 0323538	A	12-07-1989	AU 2646588 A	13-07-1989
			BR 8900058 A	05-09-1989
			CA 1311649 C	22-12-1992
			DE 3876406 D1	14-01-1993
			DE 3876406 T2	01-04-1993
			ES 2012211 A6	01-03-1990
			FI 885964 A	09-07-1989
			JP 1222734 A	06-09-1989
			JP 2761393 B2	04-06-1998
			MX 169376 B	30-06-1993
			NO 885461 A	10-07-1989
			NZ 227197 A	28-05-1990
			PT 89390 A	04-10-1989
			US 4899650 A	13-02-1990
			US 4992285 A	12-02-1991
US 4418085	A	29-11-1983	FR 2512645 A1	18-03-1983
			IT 1189365 B	04-02-1988
US 5780091	A	14-07-1998	NONE	
CA 1299434	C	28-04-1992	NONE	
EP 0882406	A	09-12-1998	AT 199815 T	15-04-2001
			AU 751649 B2	22-08-2002
			AU 6991698 A	10-12-1998
			BR 9801777 A	18-01-2000
			CA 2234593 A1	06-12-1998
			DE 69704345 D1	26-04-2001
			DE 69704345 T2	12-07-2001
			DK 882406 T3	23-07-2001
			ES 2156335 T3	16-06-2001
			GR 3035877 T3	31-08-2001
			IL 124129 A	31-10-2000
			JP 3054398 B2	19-06-2000
			JP 11009240 A	19-01-1999
			NO 982198 A	07-12-1998
			PT 882406 E	29-06-2001
			RU 2178656 C2	27-01-2002
			US 6749878 B1	15-06-2004
US 3798343	A	19-03-1974	NONE	
US 4711165	A	08-12-1987	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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01-07-2009

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 6558720	B1	06-05-2003	US	6263789 B1		24-07-2001
			US	6303165 B1		16-10-2001

US 2005181100	A1	18-08-2005	EP	1576889 A1		21-09-2005

EPO FORM P0459

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